

suggest the above-mentioned feature. Examiner Chu also agreed to withdraw the objection raised with respect to Claim 8. Examiner Chu, however, noted that the amendments would be fully considered upon submitting a formal response to the Office Action.

In the outstanding Office Action, Claim 8 was objected as having minor informalities; Claims 1, 4, and 6 were under 35 U.S.C. 103(a) as being unpatentable over Hirose in view of McCormick; Claim 8 was rejected as being unpatentable over Hirose in view of Mertol; Claims 7, 13 and 14 were allowed; and Claims 3 and 5 were objected to as being dependent on a rejected base claim, but indicated to be allowable if rewritten in independent form including all the limitations of the rejected base claim.

In response to the rejection under 35 U.S.C. §103(a), Applicants have amended Claim 1 to more clearly define the features recited therein. Specifically, amended Claim 1 recites *inter-alia* “... a second metal plate disposed directly on and in contact with a first metal plate.” None of the prior art references of record teach or suggest the above-recited feature. It is believed that Claim 1 is now in condition for allowance. Claims 3-6 depend from Claim 1, and are therefore believed to be in condition for allowance as well.

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hirose in view of Mertol. Specifically, in item 5, the first paragraph on page 5 of the Office Action notes Hirose as teaching “a mounting frame including a flange along a periphery thereof for engagement with a peripheral part of the insulating substrate at the first main surface, the flange pressing the peripheral part of the insulating substrate toward the external heat sink to force the insulating substrate into pressure contact with the external heat sink” as recited in Claim 8. Applicants respectfully traverse the rejection in view of the following:

Claim 8 recites, among other features, that the flange of the mounting frame presses a periphery of the first conductive pattern on which a semiconductor element is mounted with

an insulative material disposed between the flange and the first conductive pattern. In contrast, Hirose's flange presses a conductive pattern (metal layer 2) on which a semiconductor element (IGBT chip 6, 7) is not mounted. See Hirose's Figure 16B. Accordingly, Hirose teaches away from the claimed invention. Mertol, however, fails to teach or suggest the above noted deficiency of Hirose.

Also, in Mertol, a flange (protrusion 16) presses a conductive pattern (traces 3) on which a semiconductor element (die 1) is not mounted with an insulative material (encapsulant 6) between the flange and the conductive pattern. See Mertol's Figure 8. Accordingly, neither Hirose nor Mertol, taken alone or in combination, teach or suggest the features recited in Claim 8. Applicants, therefore, respectfully submit that Claim 8 is patentably distinct over the prior art of record.

Since it is believed that the present amendment to Claim 1, made upon reaching an agreement with the Examiner during the October 18, 2002 interview, does not add new matter requiring further search or consideration, Applicants respectfully request that this amendment be entered.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested. While it is believed that the instant amendment places the application in condition for allowance, should the Examiner have any further comments or suggestions, it is requested that the Examiner contact the undersigned at 703-413-3000.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Registration No. 25,599
Surinder Sachar
Registration No. 34,423
Attorneys of Record



22850

Tel.: (703) 413-3000

Fax: (703) 413-2220

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Please amend Claim 1 as shown below:

1. (Twice Amended) A semiconductor module mountable on an external heat sink,
said semiconductor module comprising:

an insulating substrate for said semiconductor module, said insulating substrate
including a substrate, a first conductive pattern formed on a first main surface of said
substrate which is on the opposite side from said external heat sink, and a second conductive
pattern formed on a second main surface of said substrate which is on the same side as said
external heat sink and for contact with said external heat sink; and

a mounting frame made of metal and having a mounting surface for contact with said
external heat sink, said mounting frame including a flange along a periphery thereof for
engagement with a peripheral part of said insulating substrate at said first main surface, said
flange pressing said peripheral part of said insulating substrate toward said external heat sink
to force said insulating substrate into pressure contact with said external heat sink,

wherein said mounting frame further includes:

a first metal plate having said mounting surface, and
a second metal plate disposed directly on and in contact with said first metal plate and
having a protrusion along a periphery thereof projecting from a periphery of said first metal
plate to define a flange.